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IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF:

WILLIAM M. CANFIELD

:

: EXAMINER: PATTERSON, JR., C.

SERIAL NO: 09/895,072

:

FILED: July 02, 2001

: GROUP ART UNIT: 1652

FOR: METHODS FOR PRODUCING  
HIGHLY PHOSPHORYLATED  
LYSOSOMAL HYDROLASES

DECLARATION UNDER 37 C.F.R. 1.132

ASSISTANT COMMISSIONER FOR PATENTS  
WASHINGTON, D.C. 20231

SIR:

Now comes Stuart Kornfeld, M.D. who states that:

1. I am the David C. and Betty Farrell Distinguished Professor of Medicine at Washington University, St. Louis, Missouri.
2. My area of expertise is in lysosomal enzyme trafficking. My curriculum vitae is attached as Exhibit 1.
3. I am formerly a member of the board of directors of Novazyme Pharmaceuticals, Inc., the prior assignee of the application.

4. It is my understanding that a point of contention in this application is whether it would require undue experimentation to purify N-acetylglucosamine-1-phosphotransferase to a specific activity of at least  $10^7$  pmol/h/mg and/or phosphodiesterase -GlcNAcase to a specific activity 472,000 units/mg based on the descriptions in Bao et al ((1996) *J. Biol. Chem.* 271(49):31437-31445); Bao et al ((1996) *J. Biol. Chem.* 271(49):31446-31461) and Kornfeld ((1998) *J. Biol. Chem.* 273(36):23203-23210) notwithstanding the fact that the antibodies used in those publications were not made available to the public.
5. During a period of approximately 15 years, my lab and other labs attempted to purify these two enzymes without success notwithstanding employing state of the art biochemical methods. In addition, I am aware of other attempts at purification using monoclonal antibody affinity techniques, which also failed to yield anything other than a partially purified preparation with relatively low specific activity.
6. To be useful for affinity purification, the monoclonal antibodies must have a collection of specific attributes. These antibodies must bind with high affinity as the enzymes are a trace component of a crude protein preparation; the antibodies must not inhibit the intrinsic enzymatic activity while bound; and the binding between the antibody and the protein must be reversible under mild conditions consistent with the stability profile of the target enzyme. Although it is presumably possible to isolate other monoclonal antibodies with these required properties success would be an extremely rare event and as a result would require undue experimentation. Therefore,

it would require undue experimentation to purify the N-acetylglucosamine-1-phosphotransferase and/or phosphodiester -GlcNAcase without the two specific antibodies described in the above-identified patent application.

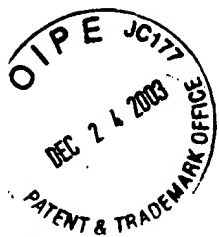
7. Therefore, the descriptions in the publications of paragraph 4 above, which are also cited by the patent office, do not provide sufficient information to enable one of skill in the art to purify the phosphotransferase and the N-acetylglucosamine-1-phosphodiester -N-Acetylglucosaminidase enzymes to the specific activities noted above.
8. I declare under penalty of perjury that the foregoing is believed to be true and accurate.

Stuart Kornfeld M.D.

Stuart Kornfeld, M.D.

12/19/03

Date



**STUART KORNFELD**

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August 28, 2002

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**Education:**

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**Academic Positions/Employment:**

1958 - 1962 Research Assistant, Biochemistry Department,  
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1962 - 1963 Intern in Ward Medicine, Barnes Hospital, St. Louis, MO

1963 - 1965 Research Associate, National Institute of Arthritis and  
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1965 - 1966 Assistant Resident in Ward Medicine, Barnes Hospital, St.  
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1966 - 1967 Instructor in Medicine, Washington University School of  
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1967 - 1970 Assistant Professor of Medicine, Washington University  
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1968 - 1976 Assistant Professor of Biochemistry, Washington University  
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1970 - 1972 Associate Professor of Medicine, Washington University  
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1972-Present Professor of Medicine, Washington University School  
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1973 - 1976 Director, Division of Oncology, Washington University  
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1976 - 1992 Co-Director, Division of Hematology-Oncology, Washington  
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1993-Present Co-Director, Division of Hematology  
Washington University School of Medicine

2000-Present David C. and Betty Farrell Distinguished Professor of  
Medicine

#### **Hospital Appointments:**

Barnes Hospital  
Jewish Hospital

#### **Appointments and Committees:**

1991-1997 Director, Medical Scientist Training Program  
2000-present Co-Director, Physician Scientist Training Program

#### **Medical Licensure and Board Certification:**

State of Missouri  
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Military Service:

1963 - 1965 Public Health Service

## **Honors and Awards:**

- Biochemistry Award, Washington University School of Medicine, 1959  
Bordon Award for Outstanding Undergraduate Research, 1962  
American Cancer Society Faculty Research Associate, 1966-1971  
Research Career Development Award, National Institutes of Health, 1971-1976  
Institute of Medicine- 1983  
National Academy of Sciences - 1982  
American Academy of Arts and Science  
Alumni/Faculty Award, Washington University School of Medicine, 1987  
Jubilee Lecturer and Harden Medallist, The Biochemical Society, 1989  
Passano Award, 1991 (with William Sly)  
E. Donnall Thomas Lectureship and Prize, 1992  
Karl Meyer Award, Society for Glycobiology, 1999  
UCSD/Nature Medicine "Mentorship Award", 2002  
Gerty & Carl Cori Faculty Recognition Award, Washington University, 2002  
Second Century Award, Washington University, 2002

## **Editorial Responsibilities:**

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|--------------|--|
| 1972-1996    | Editorial Board, Archives of Biochemistry and Biophysics         |
| 1976-1981    | Editorial Board, Journal of Biological Chemistry                 |
| 1977-1981    | Associate Editor, Journal of Clinical Investigation              |
| 1981-1982    | Editor, Journal of Clinical Investigation                        |
| 1982-1987    | Associate Editor, Journal of Biological Chemistry                |
| 1985-1991    | Editorial Board, Proceedings of the National Academy of Sciences |
| 1988-1991    | Editorial Board, Journal of Cell Biology                         |
| 1992-Present | Editorial Board, Molecular Biology of the Cell                   |
| 1997-Present | Consulting Editor, Journal of Clinical Investigation             |

## **Professional Societies and Organizations:**

- American Society for Clinical Investigation  
American Society of Biological Chemists  
American Society of Hematology  
Association of American Physicians  
Foreign Member, Finnish Society of Sciences and Letters

## **Board Memberships:**

- 1972-1975 Councillor, American Society for Clinical Investigation

1974-1977	Member, NIH Cell Biology Study Section
1983-1987	Member, NIADDK Board of Scientific Counselors
1986-1991	Secretary, Association of American Physicians
1991-1997	Councillor, Association of American Physicians
1986-1994	Member, Scientific Review Board, Howard Hughes Medical Institute
1987-1995	Member, Board of Scientific Advisors, Jane Coffin Childs Memorial Fund for Medical Research
1995-2000	Medical Advisory Board, Howard Hughes Medical Institute
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### Teaching Title:

Professor of Medicine and Molecular Biology,  
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3. Kornfeld, S. and L. Glaser. The enzymatic synthesis of thymidine-linked sugars. I. Thymidine diphosphate glucose. *J. Biol. Chem.* 236: 1791-1794, 1961.
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glycoproteins. In: The Glycoconjugates, 2, M.I. Horowitz and W. Pigman (eds.) Academic Press, 437-447, 1979.

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